Kelly (H. A.)



THE STEPS OF THE

# CESAREAN SECTION:

## THE DO'S AND THE DON'T'S.

BY

HOWARD A. KELLY, M.D.,

Professor in Gynecology to the Johns Hopkins University; Gynecologist and Obstetrician to the Johns Hopkins Hospital.

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### INTRODUCTORY.

With the recent extension of the field of the "modern" "conservative" "Saenger" Cesarean section, I feel there has arisen the necessity for a handy, simplified, condensed description of the technique of the operation.

Having recently completed my fourth successful Cesarean operation, in the Johns Hopkins Hospital, I have again carefully reviewed the various steps of this important procedure, and believe that the present *multum in parvo* will prove neither too short nor too long for the surgeon who desires to carefully review the steps before proceeding to an operation.

I have made several departures from routine practice, in facilitating drainage with my pad, in clamping the cord instead of tying it as the child is delivered, and in recommending, in cases free from all suspicion of sepsis, the use of a half-deep suture for accurate approximation of the edges of the uterine wound, between the deep sutures, instead of the sero-serous sutures.

For practical purposes, the Cesarean operation may be described as consisting of the following steps:

[1] Read before the Baltimore Obstetrical and Gynecological Society March 11th, 1891.

I. *Selection of the Case.*—The Cesarean section is *absolutely necessary* to save life in women with flat pelves in which the conjugata vera measures 6 cm. or less, or in generally contracted pelves of 6½ cm. or less.

The indication is also *absolute* when the pelvis is choked by a bony tumor, or a fibroid tumor which cannot be displaced, or by extensive cellulitis, or in some cases of extensive cancer of the uterus and vagina.

In pelves from 6 and 6½ cm. up to 8 and 9 cm., flat and generally contracted pelves, respectively, the Cesarean sec-

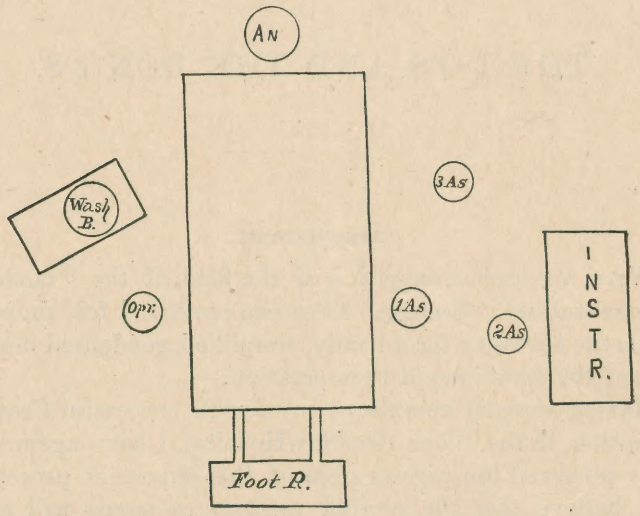


Fig. 1 shows the arrangement of assistants, etc., at the operation. The table stands in the middle, long enough for the patient's body, with a foot rest below. The anesthetizer sits at the head of the table (An). The operator stands to the patient's right (Opr), with a wash bowl full of warm water to his left, in which to dip his hands from time to time. Directly opposite to him stands his first assistant (1As), backed by the second assistant (2As), and the table carrying the instruments, sponges, etc. Two or three feet away stands the third assistant waiting to take the child.

tion is purely an *elective procedure*, standing in juxtaposition to artificially induced premature labor, spontaneous delivery (rare), delivery by forceps, turning, and craniotomy.

Under these circumstances the Cesarean section may be performed when previous labors have demonstrated the futility of attempting to save the life of the child by any other method.

II. *The Preparation of the Patient.*—When possible, daily

preparatory baths should be given for one week, cleansing the skin and stimulating its circulation, and thus enhancing its activity as an emunctory. A vaginal douche of boric acid (two per cent), night and morning, renders important service by cleansing an area in direct communication with the field of operation. Immediately before the operation the vagina should be washed very thoroughly with soap and water.

The bowels must be regulated, being freely opened from

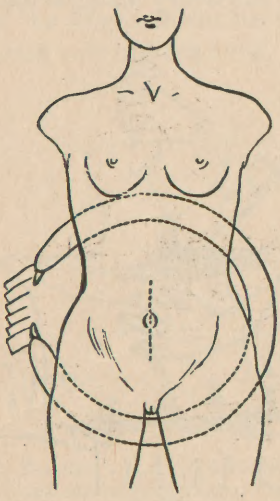

FIG. 2.

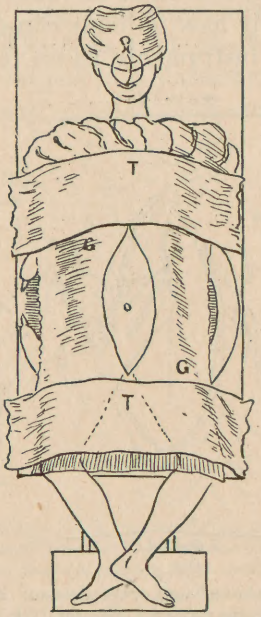


FIG. 3.

FIG. 2 shows the patient placed on the writer's ovariotomy pad for drainage, facilitating the abundant use of water, without discomfort to the operator, and without soaking the patient's night dress, which is pulled up under the shoulders. The dotted line in the middle shows the position of the abdominal incision.

FIG. 3 shows the patient anesthetized on the table, prepared for the operation. G G is the piece of gauze, reaching from chest to knees, covered above and below by two prepared towels, T T, and slit open in the middle, exposing the field of operation.

four to eight hours before the operation. The genitals are shaved when the patient is placed on the operating table.

III. *The Time to Operate.*—Operate at the end of pregnancy. If this can be accurately determined, it is not necessary to wait for labor pains. It is always better to operate before the amnion has broken.

IV. *The Instruments* needed are a small knife, a pair of scissors, a needle holder and needles, a half-dozen artery forceps, towels, gauze, ligatures, and sponges—all absolutely aseptic.

V. *Cleanliness at the Operation.*—The whole field must be microscopically clean. This aseptic condition must include the patient's abdomen and genitals, the operator's hands, arms, and at least the external portion of the clothing. The assistants also must be equally clean. The operator must continually have a lively consciousness of the aseptic condition of all instruments, gauze, towels, and every material liable in


FIG. 4.

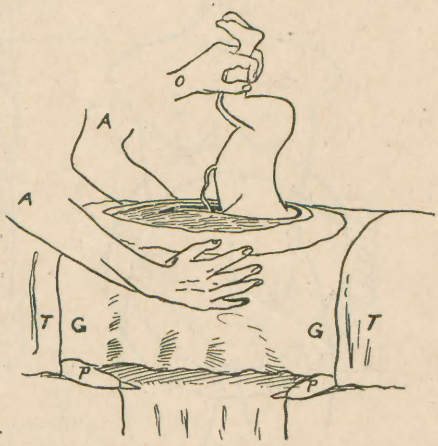


FIG. 5.

FIG 4 shows hands of the assistant (A A) engaged in pressing the abdominal walls in on the uterus while the operator (O) is incising the uterus.

FIG. 5.—The operator (O), having grasped the child by both feet, is delivering it, while the assistant (A A) constantly keeps the abdominal walls pressed in on the uterus. G G, gauze; T T, towels above and below; P P, the drainage pad.

any way to come into direct or indirect contact with the patient's abdomen.

VI. *Number and Arrangement of the Assistants.*—Four are needed. One gives the anesthetic; the chief assistant stands opposite to the operator, assisting him at the wound in every step, while a third quickly passes sponges and ligatures, artery forceps, etc., as they are needed, and a fourth waits ready to receive the child.

VII. *Is the Child Alive?*—Just before operating make sure that the child is living, and determine accurately its po-

sition in utero; this may save the error of operating on a relative indication, for a dead child, as well as facilitating the delivery.

VIII. *The Posture of the Patient, and the Immediate Preparation of the Field for the Operation.*—She should be placed upon the ovariotomy drainage pad, on a short table, with her knees at the edge so that the feet rest on the seat of a chair turned with its back to the table. This is an easy, relaxed posture and facilitates cleansing the vagina. The abdomen is then again thoroughly washed with soap and water, with as much care as if for the first time. The legs, from the lower part of the thighs down, are next wrapped in a blanket which is covered with rubber cloth. A piece of gauze, long enough

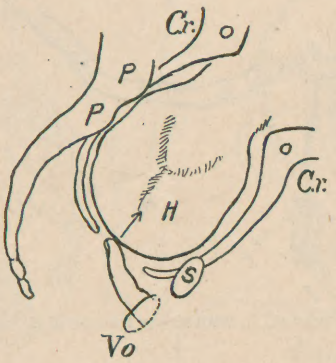


FIG. 6.—The child's head (H) is wedged in a rachitic pelvis between double promontory (P P) and symphysis pubis (S). The head is also grasped by the contraction ring (Cr.) Two fingers are seen below disengaging the head by pushing it up through the vaginal outlet (Vo.) in the direction of the arrow.

to reach from the breast to the knees, and wide enough to hang down over both flanks, is laid on the abdomen, and two towels, wrung out of hot water, laid one across the lower part of the chest, and the other over the upper part of the thighs, thus covering the body from breast to knees. The gauze is then slit open in the middle line and drawn aside, baring the whole uterine eminence. Through this opening, thus hemmed in and protected on all sides, the operation is performed in an artificially created aseptic field.

IX. *The Abdominal Incision* should be made in the median line, over the most prominent part of the tumor, about one-third above and two-thirds below, or half above and half

below, the umbilicus. Unless unusually large vessels are severed, do not waste time in clamping and tying off bleeding points.

X. *Incision of the Uterus in Situ.*—As soon as the abdomen is opened, the prominent uterus, lying directly behind the peritoneum, fills the lumen of the incision. The assistant should at once press the abdominal walls of both sides down against the uterus, protecting the abdominal cavity from contamination with the uterine contents. The operator assures himself that he has selected the median line of the uterus, and then makes an incision from 15 to 18 cm. in length, from a point just below the fundus, down towards the cervix. This

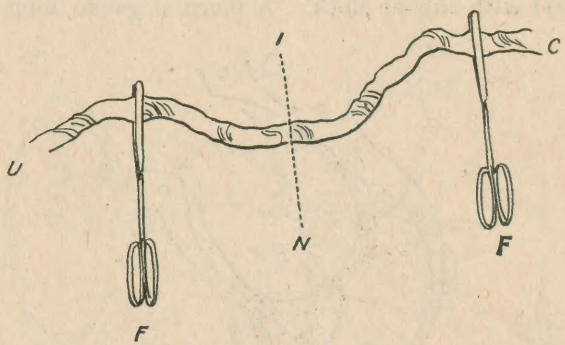


FIG. 7.—Clamping the cord (U C) with artery forceps (F F), and cutting between I N instead of ligating.

incision is cautiously extended through the whole thickness of the uterine wall until a part of the membranes is exposed.

XI. *Breaking through the Membranes; Placenta Previa Cesareana.*—The unruptured amnion pouts into the wound, looking like a sac filled with dark fluid. The operator must at once break this membrane, and, with the knife guided by the index finger in utero, cut from within outward, dividing the whole thickness of the uterine wall from one end of the incision to the other.

XII. *Delivery of the Child.*—As the assistant keeps the abdominal walls closely applied to the uterus, while the waters are gushing out the operator seizes the breech, or one or both feet, preferably keeping the child's back in front, and then slowly but steadily extracts the child. If by mistake an arm is grasped, it must be dropped and a leg sought for.

If the placenta should lie in the line of the incision (placenta previa cesareana), run the fingers between it and the uterine wall, find its margin and break through the membranes there, and grasp the feet and extract as before.

XIII. *Delivery of the Head.*—The child's head is frequently grasped by the lower uterine segment, delaying its delivery very materially. It can best be freed by hooking the fingers of one hand into the maxillary fossa, and flexing the head until it presents its smallest diameters to the superior strait and contracted lower uterine segment, while the other hand is occupied in making traction on the child's legs in the

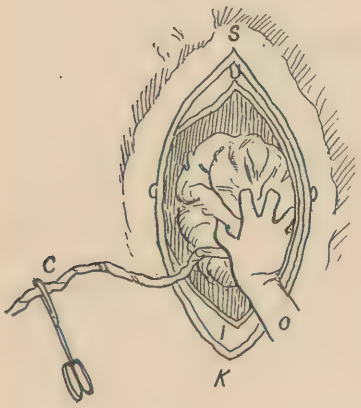


FIG. 8.

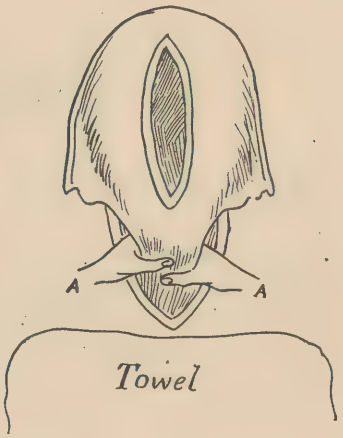


FIG. 9.

FIG. 8.—The right hand of the operator grasps the placenta, and squeezing it together separates and gradually removes it. S K, the skin incision; U I, the uterine incision; C, the cord.

FIG. 9.—Hemorrhage from the uterus controlled by firm pressure on the cervical region, by the hands of the assistant (A A).

axis of the uterus. If this does not at once succeed in releasing the head, use the pelvic hand to straddle the neck and shoulders, both assisting in the traction efforts and pushing down the occiput with a finger in the effort to secure flexion at the same time. A head incarcerated in the pelvis should be recognized before the operation, when an assistant prepares to push it through the vagina, if delivery by the other methods proves at all difficult.

XIV. *Double Clamping and Cutting the Cord.*—Clamp the

cord between two artery forceps and cut between them, handing the child at once to an assistant fully competent to resuscitate an asphyxiated child.

XV. *Removal of the Fetal Envelopes.*—If the placenta does not already lie loose in the uterus, it may be grasped in the full hand and squeezed like a sponge toward its centre;

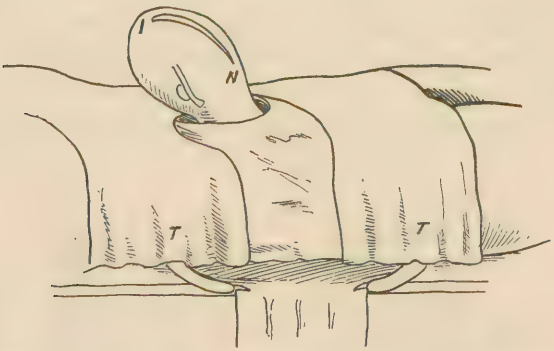


FIG. 10.—Side view of the patient. The uterus brought out of the abdominal incision and laid on a towel (T) while its incision (I N) is being sewed up.

thus separating it while the membranes peel off as it is slowly withdrawn from the uterus.

XVI. *Uterine Hemorrhage.*—If the flow of blood from the uterine incision is at any time excessive, the assistant should grasp the neck of the uterus in both hands, and, by making

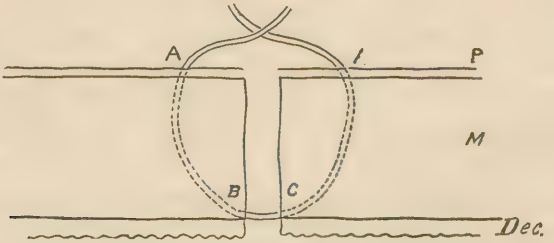


FIG. 11.—The deep suture inserted. P, peritoneum; M, muscularis; Dec, decidua.

firm pressure, control the hemorrhage until the deep sutures are introduced.

XVII. *Delivery of the Uterus from the Abdomen.*—The operator may next raise the body of the uterus entirely out of the abdominal cavity, resting it upon six or eight thicknesses of antiseptic gauze wrung out of hot water (120° F.)

The gauze occludes the abdominal wound above, and retains the intestines, as well as catching any further bloody discharge from the uterus.

With thin abdominal walls and a narrow conjugate, the uterus often lies so near the surface and so conveniently disposed that it is entirely unnecessary to lift it out of the abdomen. It is then sutured *in situ*.

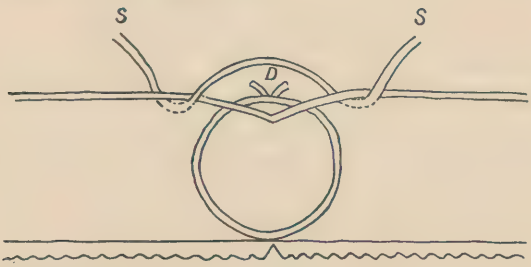


FIG. 12.—The superficial sero-serous suture (S S) introduced. When drawn up and tied, this completely covers in the deep suture (D).

XVIII. *Uterine Suture.*—The sutures are disposed in two layers, the deep and the superficial. (*a*) Deep silk sutures closing the uterine wound are first introduced, numbering two or three to the inch, or one to twelve millimetres. Each deep suture is entered about one centimetre from the margin of the incision (at A), penetrates the whole thickness of the uterine wall down to the decidua (at B); it is then entered on the incised surface of the opposite side at the decidual margin (at C), and brought out on the peritoneal surface of the uterus at a point corresponding to the point of entrance (at I). If there is any active bleeding, sutures may be tied as they are introduced, until the vessel is controlled. If there is no active bleeding, they may be safely left untied until the last

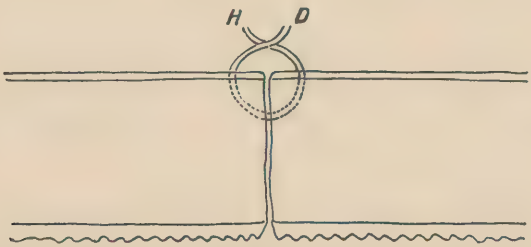


FIG. 13.—The half-deep suture (H D), insuring accurate approximation between the deep sutures.

suture has been introduced. Tie each suture with just enough firmness to bring the cut surfaces snugly together and to blanch a small area of the uterine tissue in the immediate neighborhood of the suture; never tie very tightly, and above all things avoid a slack tie.

A uterine wound reaching into the lower segment of the uterus must be approximated with especial care on account of the thin lax tissue and a great venous sinus there. From eight to twelve deep sutures will commonly be needed to close the whole wound.

(*b*) *Superficial Sero-serous Sutures.*—With a fine needle and about twice as many interrupted sutures of fine silk, the serosa and underlying muscularis just outside the lines of puncture of the deep sutures are slid over the top of the incision thus closed, completely hiding the line of deep sutures.

(*c*) Half-deep sutures, passed between each of the deep sutures, take the place of the sero-serous. They are introduced after the deep sutures are tied, and sweep through both lips of the closed incision, including not more than one-fourth of the thickness of the uterine wall. By this means the approximation is made accurate and pouting between the deep sutures corrected.

XIX. *Cleansing the Abdomen previous to Closure.*—Hook up the lower angle of the abdominal incision with first and second fingers, and carefully sponge out the vesico-uterine pouch, the iliac fossæ, and lastly the small intestines and Douglas' cul-de-sac; the uterus is then dropped down into the pelvis. If blood and amniotic fluid have escaped into the abdomen, pour in a litre of water (108° F.) and wash the lower abdominal cavity well out.

XX. *Drawing Down the Omentum.*—If septic infection is excluded with certainty, the omentum should be drawn over the uterus, protecting it and the viscera from the abdominal incision.

If there is a possibility of septic infection, as after previous instrumental interference and prolonged labor, it is better to draw the omentum down behind the uterus, thus separating it from the small intestines and leaving it in close relation to the abdominal incision. A septic process may thus be local-

ized and discharged through the abdominal wall, thereby saving the patient.

XXI. *Closure of the Abdominal Incision.*—Finally the abdominal cavity is closed by ten or twelve silk sutures, about twelve millimetres apart, embracingall the layers. Between each of these deep sutures superficial sutures should be passed wherever the approximation is not perfect.

### THE SUBSEQUENT CARE OF THE CASE.

An accurate record of pulse, temperature, and amount of urine passed and amount of sleep should be kept.

Immediately after the operation separate the labia, wipe out the vaginal outlet, and throw in three to four drachms of the iodoform and boric acid powder (1 to 7); this keeps the discharges sweet at the only point at which they are in contact with the air.

Every time the nurse draws the urine she first wipes off the orifice of the urethra with a piece of absorbent cotton and throws a drachm of the powder into the vulvar orifice.

A pad of absorbent cotton is kept loosely applied to the vulva by a T-bandage, and changed as often as soiled, or every three hours at first.

There is no reason why the baby should not nurse the day after the delivery—in from twelve to twenty-four hours.

The abdominal sutures should all be removed on the eighth day, and a firm abdominal binder applied.

It is always a matter of interest, after emptying the uterus, to note where the lower segment is sharply defined by the formation of the prominent shelf-like contraction ring.

Before closing the abdomen measure the conjugata vera.

### ERRORS TO BE AVOIDED.

I. Do not use antiseptic solutions for instruments or hands after the operation has begun; above all, do not use them in the abdominal cavity. Use pure water throughout, preferably distilled, which has been boiled a half-hour.

II. Do not turn the uterus out of the abdomen before delivering the child, unless its contents are doubtfully septic; it does no good, adding an unnecessary step and calling for a larger abdominal incision.

III. Do not cut the placental tissue, thus bleeding the child, in placenta previa cesareana.

IV. Do not waste time picking off small shreds of decidua from the inner surface of the uterus.

V. Do not do a conservative Cesarean operation when the uterus is already septic. If the uterus is infected, do a supra-vaginal amputation after Porro's method.

VI. Do not use catgut of any kind as a uterine suture. It has proven dangerous and uncertain.

VII. Never use a continuous suture in the uterus.

VIII. Do not attempt to drain the abdominal cavity; it cannot be done effectually.

IX. Do not douche out the vagina, as a matter of routine, after the operation. It must be carefully disinfected beforehand; afterwards an aseptic genital tract will need no active antiseptic régime.

X. Lastly, let all the preparations be so fully and carefully made beforehand that no time shall be lost, and each successive step shall follow its predecessor with the utmost rapidity consistent with accuracy, and the whole be completed with despatch.

I have thus endeavored to insist that a certain simple, rational technique, now shown by an abundant experience to contain all the factors of success, shall be universally adopted.

I must insist that my countrymen, in particular, shall cease making useless experiments, unwittingly repeating over and over again the errors of their predecessors.

No man has any longer a right, unless upon the basis of a large experience, to materially modify any details of this operation, if he be unwilling to bear the imputation of unwarrantable trifling with the most sacred trusts committed to his care.